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EXAMINER	
ALSOMIRI, ISAM A	
ART UNIT	**PAPER NUMBER**
3662	

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/712,005	SPANKE, DIETMAR	
	Examiner	Art Unit	
	Isam Alsomiri	3662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-82* is/are pending in the application.

4a) Of the above claim(s) *22,23 and 67-71* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-21,24-26,28-41,45-58,61-66 and 72-82* is/are rejected.

7)☒ Claim(s) *27,42-44,59 and 60* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 10/067,312.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Note: applicant's amendment on (January 9, 2006) to the claims has changed the restriction election requirement between group I-IV to only two groups I and II:

Group I: Claims 14-21, 24-66, and 72-82, drawn to a measuring device wherein a repetition rate of the transmit signal is set at a range above 1 MHZ and the center frequency of the transmit signal is set a range above 0.5 GHz, and a center frequency of the intermediate-frequency signal lie: above 50 KHz, classified in class 342, subclass 137.

Group II: Claims 22-23 and 67-71, drawn to a measuring device including storing a first signal sequence, which represents a numerically performed multiplication of the sampling sequence by digital sine-wave signal sequence, and a second signal sequence, which represents a numerically performed multiplication of the sampling sequence by a digital cosine-wave signal sequence, classified in class 342, subclass 195.

Applicant's election with traverse of group I in the reply filed on January 9, 2006 is acknowledged. The traversal is on the ground(s) that "differences in subclassification cannot form the bases for an election". This is not found persuasive because as mentioned in the office action the groups are related as subcombination usable together, and each is separately usable and does not require the specifics of the other group(s). Therefore, because the difference in classification (which may includes the

same class and different sub-classes) and the divergent subject matter, the restriction is proper.

Claims 22-23 and 67-71 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Group II, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on January 9, 2006.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

Claims 64-66 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 16, 15, and 33, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claims 73 and 79-80 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 73 does not further limit claim 72, and claims 79-80 do not further limit claim 78.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 14-16, 20-21, 28-36, 47-58, 61-62, and 64-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otto et al. (911) in view of Woodward et al. and Lalla et al. US006087978A.

Referring to claims 14, 29-32 and 62, Otto discloses in figures 1 and 2 a level measuring device operating transmit signal (S_2) and receive signal (E_2), a control unit with a volatile data memory 50 for storing a sampling sequence currently representing intermediate-frequency signal (see col.1 lines 52- with microwaves (see Abstract), a transmission circuit 16 and a reception circuit 20, which reads on the claimed a transceiver unit for generating an intermediate-frequency signal by means of 57, col. 5 lines 50-57). Although Otto does not talk about intermediate-frequency signal in the specification, the output signal of the mixer 38 to the A/D converter 46 is an intermediate-frequency (digital), which is equivalent to the claimed intermediate-frequency signal (ZF). Otto teaches transmitting a signal into a vessel, and detecting the reflected signal, Otto does not teach a transducer element (1), which couples transmitted waves into the vessel under control of the transmit signal (S_2) and convert the reflected waves into the receive signal (E_2), Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control

of the signal from the transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art.

Otto does is silent about the repetition rate, transmitted and IF center frequencies. Lalla teaches a similar system including repetition rate of several MHz, transmitting frequency of several GHz, and IF frequency below 100 Khz (see col. 5 lines 41-51). Which reads on the claimed repetition rate above 1MHz, center frequency of transmit signal above 0.5 GHz, and center frequency of IF above 50 KHz. It would have been obvious to modify Otto to include the frequencies of Lalla for more accurate measurements with less signal-to-noise ratio.

Referring to claims 15-16, 64-65, Otto discloses in figures 1 and 2 a level measuring device, which determines the level by means of amplitude information and phase information derived from the sampling sequence (see col. 4 lines 10-20, col. 5 lines 27-37).

Referring to claim 20, Otto discloses in figure 1 a control unit with a volatile data memory 50 for storing a digital phase sequence from the output of the A/D converter 46, which represents a normalization of the intermediate-frequency signal to an amplitude variation of the intermediate frequency signals (see col. 1 lines 52-57, col. 5 lines 10-37 and 50-57), which also inherently correspond to phase variation of the intermediate frequency signal (see col. 4 lines 10-16, col. 5 lines 38-43).

Referring to claim 21, Otto teaches storing a digital envelope, which represents an amplitude variation of the intermediate-frequency signal (see col. 5 lines 27-52).

Referring to claims 33, 50, 66,Otto discloses in figures 1 and 2 an amplifier 40 and a logarithmizing unit 42, which reads on the claimed logarithmic amplifier for the intermediate-frequency signal (see col. 5 lines 20-27).

Referring to claims 28 and 48, Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control of the signal from the transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art.

Referring to claims 34, 49, 51-54, Otto discloses in figures 1 and 2 a level measuring device operating with microwaves (see Abstract), a transmission circuit 16 and a reception circuit 20, which reads on the claimed a transceiver unit for generating an intermediate-frequency signal by means of transmit signal (S_2) and receive signal (E_2), a control unit with a volatile data memory 50 for storing a sampling sequence currently representing intermediate-frequency signal (see col.1 lines 52-57, col. 5 lines 50-57). Although Otto does not talk about intermediate-frequency signal in the specification, the output signal of the A/D converter 46 is an intermediate-frequency, which is equivalent to the claimed intermediate-frequency signal (ZF). Otto teaches transmitting a signal into a vessel, and detecting the reflected signal, Otto does not teach a transducer element (1), which couples transmitted waves into the vessel under

control of the transmit signal (S_2) and convert the reflected waves into the receive signal (E_2), Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control of the signal from the transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art.

Otto does is silent about the repetition rate, transmitted and IF center frequencies. Lalla teaches a similar system including repetition rate of several MHz, transmitting frequency of several GHz, and IF frequency below 100 Khz (see col. 5 lines 41-51). Which reads on the claimed repetition rate above 1MHz, center frequency of transmit signal above 0.5 GHz, and center frequency of IF above 50 KHz. It would have been obvious to modify Otto to include the frequencies of Lalla for more accurate measurements with less signal-to-noise ratio.

Referring to claims 35 and 36, Otto discloses in figures 1 and 2 a level measuring device, which determines the level by means of amplitude information and phase information derived from the sampling sequence (see col. 4 lines 10-20, col. 5 lines 27-37).

Referring to claim 47, Otto teaches storing a digital echo function (see col. 52-57) which reads on the claimed digital envelope as admitted by the applicant (see applicant's amendment page 10 lines 3-7). Furthermore, it's inherent that the stored

digital data represent a temporal amplitude variation of the intermediate-frequency signal.

Referring to claims 50, 55, Otto discloses in figure 2 a logarithmic amplifier 42 and 40, for the intermediate frequency from mixer 38, the logarithmic amplifier is coupled to the analog-to-digital converter 46.

Referring to claim 61, The combination of Otto et al. and Woodward are silent about having a communication unit for sending measuring data to a remote area. However, transmitting the measurement data to a different location (station) is widely used for many different systems, where frequent automatic readings (measurements) are taken; therefore, official notice taken that communicating the measurement data to a remote station is well known, and is obvious to include for convenient and for frequent measurements.

Referring to claims 56, Otto discloses in figures 1 and 2 a level measuring device operating with microwaves (see Abstract), a transmission circuit 16 and a reception circuit 20, which reads on the claimed a transceiver unit for generating an intermediate-frequency signal by means of transmit signal (S_2) and receive signal (E_2), a control unit with a volatile data memory 50 for storing a sampling sequence currently representing intermediate-frequency signal (see col.1 lines 52-57, col. 5 lines 50-57). Although Otto does not talk about intermediate-frequency signal in the specification, the output signal of the mixer 38 to the A/D converter 46 is an intermediate-frequency, which is equivalent to the claimed intermediate-frequency signal (ZF), the control unit 50 inherently has a digital level, it is coupled to the A/D converter that provide digital

intermediate-frequency signal. Otto teaches transmitting a signal into a vessel, and detecting the reflected signal, Otto does not teach a transducer element (1), which couples transmitted waves into the vessel under control of the transmit signal (S_2) and convert the reflected waves into the receive signal (E_2), Woodward teaches using a transducer element 2 coupled to the transceiver for transmitting waves into the vessel under control of the signal from the transceiver, and convert the reflected waves into receive signal to the transceiver (see Figure 1, Abstract). It would have been obvious to modify Otto's system to include a transducer for a better range and because it is known and only requires the knowledge of one skilled in the art.

Otto does is silent about the repetition rate, transmitted and IF center frequencies. Lalla teaches a similar system including repetition rate of several MHz, transmitting frequency of several GHz, and IF frequency below 100 Khz (see col. 5 lines 41-51). Which reads on the claimed repetition rate above 1MHz, center frequency of transmit signal above 0.5 GHz, and center frequency of IF above 50 KHz. It would have been obvious to modify Otto to include the frequencies of Lalla for more accurate measurements with less signal-to-noise ratio.

Referring to claim 57, as mentioned above Otto teaches a control unit with a volatile data memory 50 for storing a sampling sequence currently representing intermediate-frequency signal (see col.1 lines 52-57, col. 5 lines 50-57). Furthermore, the memory in the computer is finite which reads on a finite sampling sequence currently representing the intermediate-frequency signal.

Referring to claim 58, Otto discloses in figure 2 a logarithmic amplifier 42 and 40, for the intermediate frequency from mixer 38, the logarithmic amplifier is coupled to the analog-to-digital converter 46.

Claims 17-19, 24-26, 37-41, 45-46, 63, 72-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otto et al. (911) in view of Woodward et al. and Lalla et al. US006087978A and Josef Fehrenbach et al. (DE 44 07 369 A1).

Referring to claims 17 and 24, Otto teaches several echo functions in sequence may be stored in the RAM of the computer, it would be obvious if not inherent that the functions must be of digital sine-wave signals and/or cosine-wave signals by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences (see col. 5 lines 50-57). Furthermore, Josef teaches signal sequences SIN_{AF} first signal sequence and COS_{AF} second signal sequence (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing signal sequence SIN_{AF} and COS_{AF} by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences to achieve more accurate results and better probability.

Referring to claims 18, 25-26, the combination of Otto and Woodward does not teach a first quadrature-signal sequence (Q) represents a numerically performed downconversion of (SIN_{AF}) and/or a second quadrature-signal sequence (I) represents a numerically performed downconversion of COS_{AF}. Josef teaches digital quadrature-signal sequences Q, I, signals sequences SIN_{AF} COS_{AF}, which can be converted,

according to the well-known trigometric relationship, into a corresponding amplitude or phase value, which reads on the claimed first quadrature-signal sequence (Q) represents a numerically performed downconversion of SIN_{AF} and a second quadrature-signal sequence (I) represents a numerically performed downconversion of COS_{AF} (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing the quadrature-signals (Q) and/or (I) to achieve more accurate results and better signal evaluation.

Referring to claim 19, as mentioned above the combination of Otto, Woodward, and Josef teaches generating the first quadrature-signal sequence, which is inherently based on an average-value sequence held in the memory. Even if it is not inherent it would be obvious to take the average-value sequence to generate the first quadrature-signal sequence because of possible errors, taking the average will reduce error in the calculation.

Referring to claims 37 and 38, Otto teaches several echo functions in sequence may be stored in the RAM of the computer, it is obvious that the functions must be of digital sine-wave signals and/or cosine-wave signals by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences (see col. 5 lines 50-57). Furthermore, Josef teaches signal sequences SIN_{AF} first signal sequence and COS_{AF} second signal sequence (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing signal sequence SIN_{AF} and COS_{AF} by multiplying

the signal sequence by digital sin-wave or cos-wave signal sequences to achieve more accurate results and better probability.

Referring to claims 39 and 40-41, 63, 72-82, the combination of Otto and Woodward does not teach a first quadrature-signal sequence (Q) represents a numerically performed downconversion of (SIN_{AF}) and/or a second quadrature-signal sequence (I) represents a numerically performed downconversion of COS_{AF}, Josef teaches digital quadrature-signal sequences Q, I, signals sequences SIN_{AF} COS_{AF}, which can be converted, according to the well-known trigonometric relationship, into a corresponding amplitude or phase value, which reads on the claimed first quadrature-signal sequence (Q) represents a numerically performed downconversion of SIN_{AF} and a second quadrature-signal sequence (I) represents a numerically performed downconversion of COS_{AF} (see applicant's specification regarding DE 4407369A1 page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing the quadrature-signals (Q) and/or (I) to achieve more accurate results and better signal evaluation.

Referring to claims 45 and 46, Otto teaches several echo functions in sequence may be stored in the RAM of the computer, it is obvious that the functions must be of digital sine-wave signals and/or cosine-wave signals by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences (see col. 5 lines 50-57). Furthermore, Josef teaches a digital signal sequences that include phase and amplitude, which reads on the claimed SIN_{AF} first digital phase sequence and COS_{AF} second digital phase sequence (see applicant's specification regarding DE 4407369A1

page 17 lines 5-11). It would have been obvious to modify the combination of Otto and Woodward to further include storing signal sequence SIN_{AF} and COS_{AF} by multiplying the signal sequence by digital sin-wave or cos-wave signal sequences to achieve more accurate results and better probability. Furthermore, it is inherent that both first and second phase variation correspond to temporal phase variation of the intermediate frequency signal.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 14-15, 21, 28-32, 34-35, 47-55, 62, and 65 are rejected under 35 U.S.C. 102(a) as being anticipated by Lalla US006087978A.

Referring to claims 14, 28-32, 34,48-55,62, Lalla discloses in figures 1-2 the transceiver unit 1, a transducer 7, control unit (40,57) with a volatile data memory 39 for holding a finite sampling sequence representing the intermediate frequency IF signal (see Abstract). Lalla also teaches using repetition rate of several MHz, transmitting frequency of several GHz, and IF frequency below 100 KHz (see col. 5 lines 41-51). Which reads on the claimed repetition rate above 1MHz, center frequency of transmit signal above 0.5 GHz, and center frequency of IF above 50 KHz.

Referring to claims 15, 21, 35, 47, 65, Lalla teaches the memory holds a digital envelope representing a temporal amplitude variation of the intermediate frequency signal (see col. 1 lines 54-60 and col. 5 lines 55 – col. 6 line 7).

Allowable Subject Matter

Claims 27, 42-44 and 59-60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 14-21, 24-66, and 72-82 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Isam Alsomiri whose telephone number is 571-272-6970. The examiner can normally be reached on Monday-Friday 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Tarcza can be reached on 571-272-6979. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Isam Alsomiri

March 20, 2006

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